TREXLER, BUSHNELL, GIANGIORGI, BLACKSTONE & MARR, LTD.
COUNSELORS AT LAW
THE CLARK ADAMS BUILDING
105 WEST ADAMS STREET, SUITE 3600
CHICAGO, ILLINOIS 60603-6210
(312) 704-1890

FOUNDED 1890

PATENT, TRADEMARK, COPYRIGHT
AND RELATED MATTERS; ALL PHASES
INCLUDING LICENSING AND LITIGATION

FAX: (312) 704-8023
www.trexlaw.com

RICHARD R. TREXLER (1906-1995)
RICHARD BUSHNELL (1926-2004)
RICHARD A. GIANGIORGI
RAIFORD A. BLACKSTONE, JR.
DAVID J. MARR
LINDA L. PALOMAR
JAMES R. FOLEY
JAMES A. O'MALLEY
TIMOTHY M. McCARTHY

November 1, 2006

VIA EXPRESS MAIL

MAIL STOP: ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Re: United States Patent Application
Serial No. 10/686,460
For: **"Humidifier With Parallel Gas Flow Paths"**
(Per amendment filed May 16, 2005)
Our Ref: Case 92D-Div. (1171/39624D)

Dear Sir:

Enclosed herewith is the Issue Fee payment and the formal drawings in connection with the above-noted case.

We noted that the title of the invention in the Notice of Allowance is "Breathing Assistance Apparatus", this title is incorrect. The correct title is -- **Humidifier With Parallel Gas Flow Paths** -- in accordance with the Amendment filed on May 16, 2005, copy enclosed.

Please make this correction, so when the patent issues it will issue with the correct title.

Should there be any questions, please contact the undersigned attorney.

Sincerely,

TREXLER, BUSHNELL, GIANGIORGI,
BLACKSTONE & MARR, LTD.

By _____
Linda L. Palomar
Registration No. 37,903

LLP/mk-9D501-1

Accordingly, it is respectfully requested that these replacement drawings be accepted and entered into the file of the above-captioned application. It is also requested that these replacement drawings be included in the printed Patent.

Respectfully submitted,

TREXLER, BUSHNELL, GIANGIORGI
BLACKSTONE & MARR, LTD.

Date: November 1, 2006

By: _____

Raiford A. Blackstone, Jr.
Reg. No. 25,156

Linda L. Palomar
Reg. No. 37,903

Attorney(s) for the Applicant

TREXLER, BUSHNELL, GIANGIORGI,
BLACKSTONE & MARR, LTD.
105 West Adams Street 36th Floor
Chicago, Illinois 60603
Telephone (312) 704-1890

PATENT

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Serial No.:	10/686,460
Applicant:	SEAKINS, THUDOR and SMITH
Filed:	October 15, 2003
For:	BREATHING ASSISTANCE APPARATUS
Examiner:	G. DAWSON
Art Unit:	3731
Attorney Docket No.:	1171/39624D/92D

Certificate of Mailing by "Express Mail"
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Date of Deposit: May 16, 2005
I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office Box Addressee" Under 37 C.F.R. §1.10 on the date indicated above addressed to The Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
Tiffany E. Sexton
Tiffany E. Sexton

AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Responsive to the Office Action dated December 23, 2004, kindly amend the above-identified patent application as follows:

IN THE TITLE:

Please cancel the existing title and replace it with the following:

HUMIDIFIER WITH PARALLEL GAS FLOW PATHS

IN THE SPECIFICATION:

Please amend the paragraph on page 6, lines 1-19 as follows:

One preferred form of the present invention will now be described with reference to the accompanying drawings in which;

Figure 1 shows an example of an humidification system, comprised of three parts,

Figure 2 shows a chamber which incorporates a metal element,

Figure 3 shows a chamber using a porous material to provide a heating and humidifying function,

Figure 4 shows a chamber using a semipermeable membrane,

Figure 5 shows a chamber with a variable valve to adjust the ratio of gas which are bypassed,

Figure 5A shows a modification to the embodiment shown in Figure 5,

Figure 6 shows a chamber with an adjustable valve 30 where one part of the gas gets humidified while the other is heated,

Figure 6A shows a modification to the embodiment shown in Figure 6,

Figure 7 shows a chamber where the dry gas entering chamber is pre-heated,

Figure 8 shows a chamber where the dry gas entering chamber is heated after leaving the chamber,

Figure 9 shows a chamber combined with an unheated, well insulated delivery tube,

Figure 10 shows construction of a tube incorporating flexible PTC elements in a parallel wire configuration,

Figure 11 shows a humidifier configuration using the tube in Figure 10, and

Figure 12 shows the chamber manifold.

~~Figure 13 is a front view of a humidifier chamber with a manually adjustable valve;~~

~~Figure 14 is a front view of a humidifier chamber with a automatically adjustable valve.~~

Please amend the paragraph on page 11, lines 3-15 as follows:

The angle of variable valves 26 and 30 in Figures 5~~;~~ and 6, ~~13 and 14~~ may be permanently set, may be manually adjustable 1300, or may be automatically adjustable for example by electromechanical actuation 1400. One advantage of an automatically adjustable valve ~~1400~~ would be to provide a constant level of humidity out of the chamber when used with intermittent flow rates, for example when used with a ventilator. These flow patterns can be a problem because parts of the breath cycle contain less humidity than other parts, due to the chamber providing less humidity at higher flow rates. One way to overcome this problem is to measure the instantaneous flow rate using a fast response flow sensor, and then rapidly adjusting the angle of the variable valve. A more practical method of achieving this effect would be to spring-load valves 26 and 30 using springs 70 and 71 or, as shown in Figures 5A and 6A, to use an elastic valve member 26A or 30A to form the variable valve. This would mean that low flow rates would mostly pass through the bypass tubes, while high flow rates would operate the spring-loaded valve and allow more gas to pass across the water in the humidification chamber. The angle of the spring-loaded variable valve could also be used by the humidifier to measure the gas flow rate.

IN THE CLAIMS:

1. (Currently Amended) ~~A humidification~~ Humidification apparatus for providing ~~humidifying~~ humidified gas ~~for~~ to a patient or other person in need of such gas comprising:

an inlet for receiving gas,

a humidifier configured to provide water vapour to at least some of said gas received at said inlet so that at least some of the received gas is humidified and/or heated,

an outlet through which humidified and/or heated gas is discharged from the humidifier, ~~providing gas with a predetermined humidity and/or temperature;~~

~~a humidifier configured to provide water vapour to said gas passing through said humidification apparatus;~~

an air heater configured to directly heat at least some of said gas passing through said humidification apparatus, in parallel to said humidifier,

at least one sensor configured to provide an indication of at least two of, relative humidity, absolute humidity and temperature of said gas,

a controller or processor configured to energise said humidifier and said air heater to achieve a ~~predetermined~~ combination of any two of predetermined absolute humidity, predetermined relative humidity and predetermined temperature of said gas.

2. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claim 1 wherein said sensor ~~comprising~~ comprises an absolute humidity sensor for providing an indication of the absolute humidity of said gas at at least one point in the flow path of said gas through said apparatus ~~of said gas;~~ and wherein said humidifier ~~including~~ includes a body of liquid water.

3. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claim 2 wherein said humidifier ~~comprising~~ comprises a metal spiral element to heat said body of water.

4. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claim 2 wherein said humidifier ~~comprising~~ comprises a heated porous ceramic member adapted to be in contact with said body of water and said gas.

5. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claim 2 wherein said humidifier ~~comprising~~ comprises a heated semipermeable membrane adapted to be in contact with said body of water and said gas.

6. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claim 1 wherein said air heater ~~having~~ has a humidification bypass, for allowing a portion of said gas to flow ~~to pass~~ from said inlet to said outlet substantially without humidification.

7. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claim 6 wherein said humidifier includes a body of liquid water, said humidification bypass ~~including~~ includes a bypass conduit ~~in~~ at least partially passing through said body of water for conveying a portion of said gas from said inlet to said outlet, substantially without humidification, and a valve is provided in said ~~bypass conduit~~ to allow restriction ~~thereby restrict the flow rate~~ of the portion of said gas ~~in~~ passing through said bypass conduit, the gas flowing through said bypass conduit being heated by the surrounding said body of water.

8. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claim 6 wherein said humidification bypass ~~further having~~ includes a bypass conduit for conveying a portion of said gas from said inlet to said outlet substantially without humidification, ~~including~~ a bypass heater adapted to heat the portion of said gas in said bypass conduit and/or said bypass conduit, and a valve provided ~~in said bypass conduit~~ to ~~thereby restrict the flow rate~~ allow restriction of the portion of said gas in said bypass conduit.

9. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claims 7 or 8 wherein the restriction of the flow rate provided by said valve is in use permanently set.

10. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claims 7 or 8 wherein the restriction of the flow rate provided by said valve is in use manually adjustable.

11. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claims 7 or 8 further comprising a flow sensor providing an indication of the instantaneous flow rate of said gas, through said humidification apparatus, wherein said ~~control~~ controller or processor is configured to control the restriction provided by said valve ~~is~~ based on said indication of instantaneous flow rate of said gas ~~through said humidifier~~, in order that the gas exiting from said ~~humidifier~~ outlet is of substantially constant humidity.

12. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claims 7 or 8 wherein said valve ~~comprising~~ comprises an electromechanical actuator

connected to a valve member wherein the energisation of said electromechanical actuator varies the position of said valve member thereby varying the restriction provided by said valve.

13. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claims 7 or 8 wherein said valve ~~comprising~~ comprises either a valve member connected to an elastic member or an elastic valve member wherein said valve ~~being~~ is positioned in said flow of gas at or near said inlet and the position of said valve member or said elastic valve member thereby determines the portion of said gas passing through ~~in~~ said bypass conduit.

14. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claim 13 wherein the position of said valve member or said elastic valve member ~~providing~~ provides an indication of the rate of flow of said gas at said inlet.

15. (Currently Amended) ~~A humidification~~ Humidification apparatus as claimed in claims 1 or 2 further comprising a conduit to convey said gas from said outlet to a patient and including insulation adapted to minimise the rate of heat energy lost by said gas in said conduit, said controller adapted to energise said humidifier and said air heater to minimise the condensation of the vapour from said gas in said conduit while providing a predetermined levels of absolute humidity.

16. Cancelled

17. Cancelled

REMARKS

Applicant, by the amendments presented above, has made a concerted effort to present claims which more clearly define over the prior art of record, and thus to place this case in condition for allowance.

Currently, claims 1-15 are pending. Claims 16 and 17 were canceled without prejudice in this Amendment.

Drawing Objections

On page 2 of the Office Action, the drawings were objected to as allegedly failing to show each and every feature of the invention specified in the claims. Applicant encloses amended Figures 5 and 6 and new Figures 5A and 6A. Applicant submits that this overcomes the Examiner objections. Entry, reconsideration and withdrawal of the rejection is requested.

Objection to Amendment of October 6, 2004

On page 3 of the Office Action, the Examiner objected to the Amendment filed on October 6, 2004 because he alleges that it introduced new matter into the disclosure. Applicant has canceled Figures 13 and 14 and any additions referencing same. Withdrawal of the objection is requested.

Disclosure Objections

On page 3 of the Office Action, the Examiner objected to the disclosure the Examiner alleges that it is unclear how the valve would be operated either manually or automatically.

Applicant submits that one of ordinary skill in the art would easily be able to discern from the description how to provide for manual operation of the valve (for example,

physically manipulating the angle of the valve member with a screwdriver or the like). Applicant further submits that the disclosure clearly refers to an electromechanical actuator on page 4 which is an example of a mechanism which provides automatic operation of the valve member.

Therefore, Applicant request withdrawal of the objection to the disclosure.

Claim Rejections - 35 U.S.C. §103

Claims 1-5 and 15-17 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over United States Patent No. 5,148,801 to Douwens in view of Japanese Publication No. JP09234247 to Yoshikazu. Reconsideration and withdrawal of the rejection is requested.

The Examiner states that in Douwens, "the air is heated parallel to air going through the water reservoir". Applicant respectfully submits that this is incorrect. In Douwens, air is heated by a heating element 106 in a chamber 105 which is serially connected to a humidification chamber 110 which is below the heating chamber (as viewed in Figure 1). Accordingly, air is heated in chamber 105 and then the heated air is humidified in chamber 110. Douwens does not disclose parallel dry and wet heating as required by amended claim 1. This is clear from the disclosure of Douwens in Col. 4, lines 15-20 where Douwens mentions that the heat exchanger includes an upper compartment and "serially interconnected thereto" at least two lower compartments for heating water. Even within the serially interconnected lower compartments, air is heated by elements 112A, 112B and 112C in series with humidification batts 115 rather than in parallel. The advantage of the claimed structure is, because some of the gas flow is dry heated, the gas exiting from the outlet of the humidification chamber is not saturated and so condensation occurring in the conduit attached

to the outlet is significantly (and controllably) reduced or eliminated. In contrast, in Douwens, as described in Col. 7, line 51, "the air is further heated and is humidified to near saturation as it flows longitudinally through the porous heating elements...".

Yoshikazu does not overcome this deficiency of Douwens.

Therefore, Applicant submits that amended claim 1 is allowable over the cited prior art. Reconsideration and allowance of amended claim 1 is requested.

Claims 2-5 and 15-17 are dependent upon amended claim 1 which Applicant submits is in condition for allowance. Reconsideration and allowance of claims 2-5 and 15-17 is requested.

Allowable Subject Matter

Applicant acknowledges with appreciation that claims 6-14 would be allowable if rewritten in independent form, including any limitations of the base claim and any intervening claims.

Information Disclosure Statement

Applicant submitted an Information Disclosure Statement on January 10, 2005. Consideration of same is requested and return of the initialed Forms PTO/SB/08A is requested.

Applicant has concurrently submitted a Petition for a Two-Month Extension of Time to extend the date for response up to and including May 23, 2005.

In view of the above, Applicant respectfully submits that the claims of the application are allowable over the rejections of the Examiner. Should the Examiner have any questions regarding this Amendment, the Examiner is invited to contact one of the undersigned attorneys at (312) 704-1890.

Respectfully submitted,

Dated: May 16, 2005

By: Raiford A. Blackstone, Jr.

Raiford A. Blackstone, Jr., Reg. No. 25,156
Linda L. Palomar, Reg. No. 37,903

TREXLER, BUSHNELL, GIANGIORGI
BLACKSTONE & MARR, LTD.
105 W. Adams Street
Suite 3600
Chicago, Illinois 60603
(312) 704-1890

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IN THE DRAWINGS:

Please cancel Figures 13 and 14 presented in the Amendment dated October 6, 2005.

Please amend Figures 5 and 6 as shown in the attachment replacement sheets.

Please insert Figures 5A and 6A as shown in the attachment replacement sheets.